

continue to be mixed, although the best CRCs are likely to be big successes. Some parts of CSIRO will be unable to adapt to a fee-for-service world.

There is a problem in young peoples' perception of science. For twenty years now the best and the brightest at matriculation have chosen not to go into Science at university. Med is as boring as ever but kids still choose it—they even need higher scores for Phys-Ed than for Science. Kids don't see Science as the adventure of new knowledge—but as the memorising of old knowledge. The way we teach persuades young people that science is boring.

Government is pre-occupied with the clever country, economic miracles and setting priorities; and it sees science as a servant to these ends. (Churchill said 'science should be on tap, not on top'.) We can define Australia in the context of:

- the structure and emphasis of the economy;
- a small domestic market;
- our long distance from larger (overseas) markets;
- our small influence in international markets;
- subsidies for our primary industries (e.g. irrigation dams);
- other incentives/disincentives influencing the economy;
- the scale and ownership of corporations in Australia;
- our industrial relations tradition;
- the barriers faced by Australia's manufactured exports cf. the (lesser) barriers faced by imports to this country;
- ideological zealotry (e.g. Industry Commission).

Australia's science policy agenda needs to contain:

- a commitment to basic science, in terms of both funding and jobs;
- a balanced portfolio of R&D, including basic science and product innovation at an appropriate scale;
- policies for innovation including tax incentives, Government coordination, purchasing policies, export incentives and import replacement incentives; and above all
- a contextualising vision.

In support of the need for a vision—if we don't know what sort of Australia we want, any science policy will do. It is a pity Australia stopped the \$½ million/year it spent on the Commission for the Future.

The private sector aims particularly at process, rather than product, innovation; and this leads to a problem. Process research to reduce labour and

material costs also reduces jobs—and therefore the work force sees it as threatening.

Although Government spending on science as a whole has remained stable over the past decade in real terms, the proportion spent on medical research has doubled. When Government says it can't afford to fund something, it is a statement of priorities not of absolutes.

Every other special interest pushes its case in Canberra for more money. Barry Jones, former Science Minister, describes scientists as 'wimpy lobbyists'. (His draft national technology strategy failed to win funding, although it still reads very well today.) Any group seeking to win a point will select its evidence—but in science, the word 'populariser' is a term of abuse!

DR LAURIE HAMMOND

(one listener's impression of his talk)

NO NEED FOR LESSONS: THE IDEAS ARE CONTAGIOUS

New Zealand's Foundation for Research, Science and Technology dispenses an annual budget of \$NZ310 on behalf of Government. However, our speaker resisted the call to provide 'lessons' from New Zealand science policy which might be applied in Australia. 'No one likes advice from little brother.'

In New Zealand, something had to be done. Prior to the reforms of the past five years, Government spending on S&T had declined 27% in real terms in the space of a decade.

The major elements of the reforms to date are as follows:

- There is now a clear split between S&T policy (the prerogative of Government)/the research purchaser (his own organisation)/and the research provider (universities and research institutes). This split has clarified the role of Government—as the formulator of policy.
- The new arrangements ensure both contestability in the provision of research (at least in theory, anyone can apply to do research in New Zealand) and full pricing for the successful research-provider (gone are the days of block funding, or of supplementary funding at the margins—research institutes therefore must re-capitalise from retained earnings).
- Government now provides a selective allocation of resources in line with its current S&T policy.

Its priorities are reflected in the dollars provided for individual R&D sectors, and this process ensures a continual 'rebalancing of the national research portfolio' to reflect future needs—not past expenditure patterns. Some continuity is inherent in the methodology, because sectoral funding strategies are on a five-year rolling basis.

- There has been an organisational restructuring of those who supply the science. DSIR is no more. A series of Crown research institutes has been erected in its stead; and it will be their individual responsibilities to remain viable. (This restructuring is more significant in the NZ context than would be the case here, because universities and industry provide proportionately only half as much research as in Australia. One of Government's aims is to use its funding to leverage-up the low level of business investment.)

The reform process continues. Over the next five years, an effort will be made to:

- Get the long-term strategic framework right. It is the intention to develop a 15-year planning horizon supplemented by 5-year priority statements. There will be no change in the 5-year funding limit.
- Evaluate investments. Different areas of policy interest will need to be allocated different levels of funding; and different evaluation methods will need to be developed to assess the economic/social/environmental outcomes of past funding initiatives.
- Shift the focus to the demand side. Less emphasis will be given to science policy and more to technology policy.

The Minister cannot direct the placement of funds—only enunciate priorities. All Government funding is distributed through contracts with the Foundation for Research, Science and Technology; and these contracts are for a maximum of five years—although longer-term horizons can be enunciated. Basic research has survived, despite fears at the outset.

Clearly, the reinvention of government in New Zealand (accountability/labour and finance reform/corporatisation/privatisation) has led to the reinvention of the science funding system.

The problem in Australia is the lack of a strategic view for science. Without that, we cannot have a science policy. Some see Australia's pluralistic Federal/State system as not requiring a policy for science. But all countries need answers to the questions: Why invest?/In what?/What is the required outcome?

There are those thinking about the topic here. The Industry Commission has canvassed the concept of contestable funding for CSIRO—although is that feasible if research funding for others is not contestable?

The Senate has attacked CSIRO for moving funding between topic areas; but the Senate sees funding 'in terms of the pork-barrel, not science priorities'. Federally, policy ideas tend to originate outside Government *per se*, largely in CSIRO. At the State level, research is handled within the bureaucracy—but science in general is a 'basket case' in the State system.

Returning now to New Zealand, the benefits flowing from the new ways of handling science policy and allocating research funds are several:

- Government confidence in science has been restored;
- sustained growth in science funding is assured—probably for 15 years;
- science has been able to escape history and embrace the future; and
- imperatives for user uptake and investment have been created. (There must be a commitment from the private sector in an area for it to attract increased funding.)

Finally, the lessons of the new way are:

- direct and comprehensive funding means that bad science, and that without priority, has nowhere to hide;
- Government thinks better when it is a strategic investor and shareholder;
- treasury-driven simple-mindedness is avoided; and
- selective investment helps to avoid short-termism and 'safe science'.

PROFESSOR MICHAEL PITMAN OBE FAA

SCIENCE POLICY: LOOKING FORWARD

Summary

Science policy is not static but needs to evolve as the context for using science changes and as different issues need to be addressed. The past year has been marked by a number of studies or consultations such as the IC Report, the ASTEC foresight study, CSIRO's futures papers and the lead up to the Innovation Statement due later this year. These consultations have collected a range of views on current policy and how it might develop.